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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/027,437	12/21/2001	Treliant Fang	20206-14	1963

7590 03/13/2003

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EXAMINER

HAMILTON, CYNTHIA

ART UNIT	PAPER NUMBER
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1752

DATE MAILED: 03/13/2003

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Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/884,708

Applicant(s)

DENZINGER ET AL.

Examiner

Cynthia Hamilton

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-- **Th MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 07 May 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-26 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-26 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

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### DETAILED ACTION

1. The papers filed on *May 7, 2002* (certificate of mailing dated *April 29, 2002*) have not been made part of the permanent records of the United States Patent and Trademark Office (Office) for this application (37 CFR 1.52(a)) because of damage from the United States Postal Service irradiation process. The above-identified papers, however, were not so damaged as to preclude the USPTO from making a legible copy of such papers. Therefore, the Office has made a copy of these papers, substituted them for the originals in the file, and stamped that copy:

### COPY OF PAPERS ORIGINALLY FILED

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If applicant wants to review the accuracy of the Office's copy of such papers, applicant may either inspect the application (37 CFR 1.14(d)) or may request a copy of the Office's records of such papers (*i.e.*, a copy of the copy made by the Office) from the Office of Public Records for the fee specified in 37 CFR 1.19(b)(4). Please do **not** call the Technology Center's Customer Service Center to inquiry about the completeness or accuracy of Office's copy of the above-identified papers, as the Technology Center's Customer Service Center will **not** be able to provide this service.

If applicant does not consider the Office's copy of such papers to be accurate, applicant must provide a copy of the above-identified papers (except for any U.S. or foreign patent documents submitted with the above-identified papers) with a statement that such copy is a complete and accurate copy of the originally submitted documents. If applicant provides such a copy of the above-identified papers and statement within **THREE MONTHS** of the mail date of this Office action, the Office will add the original mailroom date and use the copy provided by applicant as the permanent Office record of the above-identified papers in place of the copy made by the Office. Otherwise, the Office's copy will be used as the permanent Office record of the above-identified papers (*i.e.*, the Office will use the copy of the above-identified papers made by the Office for examination and all other purposes). This three-month period is not extendable.

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2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. The use of the trademark "CYRACURE 6974" has been noted in this application on page 6 for example. It should be capitalized wherever it appears and be accompanied by the generic terminology. The exact nature of the triaryl sulphonium SbF<sub>6</sub> salts should be given for this material with a showing of what it was at time of filing the application

Although the use of trademarks is permissible in patent applications, the proprietary nature of the marks should be respected and every effort made to prevent their use in any manner which might adversely affect their validity as trademarks.

7. Claim 13 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 13 contains the trademark/trade name CYRACURE 6974. Where a trademark or trade name is used in a claim as a limitation to identify or describe a particular material or product, the claim does not comply with the requirements of 35 U.S.C. 112, second paragraph. See *Ex parte Simpson*, 218 USPQ 1020 (Bd. App. 1982). The claim scope is uncertain since the trademark or trade name cannot be used properly to identify any particular material or product. A trademark or trade name is used to identify a source of goods, and not the goods themselves. Thus, a trademark or trade name does not identify or describe the goods associated with the trademark or trade name. In the present case, the trademark/trade name is used to identify/describe a class of photopolymerization initiator useful for the present invention, i.e. triaryl sulphonium SbF<sub>6</sub> salts, and, accordingly, the identification/description is indefinite.

8. Claims 22 and 25-26 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 22 and 25-26 contain the trademark/trade name "SU-8". Where a trademark or trade name is used in a claim as a limitation to identify or describe a particular material or product, the claim does not comply with the requirements of 35 U.S.C. 112, second paragraph. See *Ex parte Simpson*, 218 USPQ 1020 (Bd. App. 1982). The claim scope is uncertain since the trademark or trade name cannot be used properly to identify any particular material or product. A trademark or trade name is used to identify a source of goods, and not the goods themselves. Thus, a trademark or trade name does not identify or describe the goods associated with the trademark or trade name. In the present case, the trademark/trade name is used to identify/describe "an SU-8-based photoresist masking composition" and, accordingly, the identification/description is indefinite. Also, the specification does not make clear what "based" includes or excludes in the "SU-8-based photoresist masking composition". On page 2 is found the following:

"One group of commonly used photoresist materials are those based on octafunctional epoxidized novolac resins, and particularly those based on the SU-8 family of photoresists made from Shell Chemical's Epon ® SU-8 epoxy resin. The SU-8 photoresist materials are negative, epoxy-type, near UV photoresist materials."

This is insufficient definition of the "SU-8-based photoresist masking composition" for use in the claim language because it is unclear what the family of the Shell materials encompassed due to the use of the trademark material and because it is unclear what is encompassed by "epoxy-type". The addition of the word "type" to an otherwise definite expression (e.g., Friedel-Crafts

catalyst) extends the scope of the expression so as to render it indefinite. Ex parte Copenhaver, 109 USPQ 118 (Bd. App. 1955). The same is true of the use of "based" with respect to "SU-8-based photoresist masking composition". This confusion would extend to the inclusion or exclusion of such art as Skarvinko (4,237,216) which makes use of the reaction product of a monoethylenically unsaturated carboxylic acid and an epoxy polymer made from or "based on" the octafunctional EPI-REZ SU8 epoxy resin which is also an octaepoxy group novolac resin. Are all SU-8 resins included by "SU-8-based photoresist masking composition"? In Skarvinko, see particularly the abstract and col. 6.

9. Claims 25-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hurditch et al (US 2002/0076651 A1), Mrovs et al (US 6,409,312 B1), Mancini (US 6,459771) in view of Patel (6,439,698 B1), Kohli et al (WO 99/142277), Konarski et al (US 2002/0128353) further in view of Daniel et al (Proceedings of SPIE) and Brewer et al (4,732,858). Hurditch et al teach the addition of adhesion promoters to photoresists comprised of EPON® resin SU-8. No specific adhesion promoters are given. In Hurditch et al, see particularly paragraphs [0020-0027]. Mancini also teaches the use of such adhesion promoters with these kinds of photoresists as set forth in col. 3, lines 30-50. Mrvos et al teaches the use generally of such photoresists using silane adhesion promoters (also used as reactive diluents) in the paragraph bridging col. 5-6 and in col. 9, lines 20-34. Patel in teach using gamma-glycidyoxypropyltrimethoxysilane as a reactive diluent or film enhancing agent in a photocurable epoxy resin used as an encapsulant wherein the resin can include SU-8 material. In Patel, see particularly col. 6, last paragraph and col. 4, line 47. Kohli et al teach using gamma-glycidoxypyltrimethoxysilane, gamma-mercaptopropyltrimethoxysilane and gamma-aminopropyltrimethoxysilane with SU - 8 resins as

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part of primer solutions to improve adhesion. These are thermosetting epoxy resin compositions. In Kohli et al, see particularly the abstract, paragraph bridging pages 14-15, page 16, second paragraph, col. 12, lines 40-col. 13, lines 10, and pages 25-26. Konarski et al teach the use of adhesion promoters inclusive of glycidoxy-propyl trimethoxy silane, and aminopropyl-triethoxy silane with heat cured multiepoxide group epoxy resins. In Konarski et al, see particularly paragraphs [0069], [0062], Daniel et al teach using 3 aminopropyl-triethoxy silane and 3 glycidoxy-propyl trimethoxy silane as adhesion promoters in separate layers to be used with SU 8 resists (see page 46 in Daniel et al). Brewer et al teaches the need for adhesion promoters with silicon, silicon dioxide and silicon nitride substrates. They teach the use of aminoalkoxysilanes and glycidoxypropyltrimethoxysilanes and 3 mercaptopropylsilanes in separate priming layers for this purpose to be used generally with photoresist compositions that do not adhere well. With respect to instant claims 25-26, the use of those adhesion promoters known in the art to be compatible with SU-8 resins in the compositions of Hurditch et, Mrovs et al, and Mancini as taught by Kohli et al and Patel to improve adhesion to silicon substrates such as silicon wafers as taught by Brewer et al and Daniel et al wherein such adhesion promoters are inclusive of gamma-glycidoxypropyltrimethoxysilane, gamma-mercaptopropyltrimethoxysilane and gamma-aminopropyltrimethoxysilane would have been prima facie obvious as the use of materials for adhesion promoters that are known in the related arts to work with the SU-8 resists and to be advantageous with adherence problems to microelectronic supports.

10. Claims 22-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bantu et al (5,268,260) in view of incorporated Gerlach, Jr, et al (3,658,543). Bantu et al teach using plasticizers like those of Gerlach Jr et al in their photoimageable composition when needed. One



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of Bantu et al's compositions is one with epoxidized octafunctional bisphenol A formaldehyde novolac resin which fits the instant applicant's description of a SU-8 resin. The Gerlach, Jr et al plasticizers include dialkyl phthalates, inclusive of dioctyl phthalate as set forth in col. 10 lines 19-36. Thus with respect to instant claims 22-24, the use of any of the plasticisers of Gerlach Jr et al in the epoxy resist of Bantu et al as set forth in col. 4 of Bantu et al to aid in giving flexibility to the films formed would have been prima facie obvious.

11. Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gelorme et al (4,882,245) in view of Kline et al (6,022,050). Gelorme et al teach the instant compositions of claim 22 with the exception of the specific plasticizer given. Gelorme et al in col. 4 lines 25-40, teach using as an effective plasticizer a reactive diluent such as cycloaliphatic epoxides but also states "although other suitable reactive diluent will readily come to mind to those of ordinary skill in the art". Kline et al teach the use of diglycidyl ether of hexahydrophthalic acid and an equivalent reactive diluent for epoxy silicone resins and lists it among many of those set forth by Gelorme et al. In Kline et al, see particularly col. 6, lines 1-12. With respect to instant claim 22, the use of the diglycidyl ether of hexahydrophthalic acid in exchange for the diluents set forth by Gelorme et al would as a plasticizer would have been prima facie obvious in view of Kline et al teaching the equivalency of it with those listed by Gelorme et al and because it is to be used with an epoxy resin as a reactive diluent in the photocure arts.

12. Claims 7-12, 14-15, 18-19 and 21 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Applicants use percentages of components in these claims but never state whether it is weight or volume or a mixture of these. There is no general statement

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that all are by weight percent but all of the examples are by grams. Thus, the examiner assumes weight percent was intended here but it is not clear. Further, what is 100% weight is not given so it is unclear what the percentages reference.

13. Claims 1-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hurditch et al (US 2002/0076651 A1), Mrovs et al (US 6,409,312 B1), Mancini (US 6,459,771) in view of Patel (6,439,698 B1), Kohli et al (WO 99/142277), Konarski et al (US 2002/0128353) further in view of Daniel et al (Proceedings of SPIE) and Brewer et al (4,732,858) further in view of Gelorme et al and Kline et al and Shaw et al (Negative photoresists for Optical lithography page 9 of 16). Hurditch et al teach the addition of adhesion promoters to photoresists comprised of EPON® resin SU-8. No specific adhesion promoters are given. In Hurditch et al, see particularly paragraphs [0020-0027]. Mancini also teaches the use of such adhesion promoters with these kinds of photoresists as set forth in col. 3, lines 30-50. Mrvos et al teaches the use generally of such photoresists using silane adhesion promoters (also used as reactive diluents) in the paragraph bridging col. 5-6 and in col. 9, lines 20-34. Patel in teach using gamma-glycidioxypropyltrimethoxysilane as a reactive diluent or film enhancing agent in a photocurable epoxy resin used as an encapsulant wherein the resin can include SU-8 material. In Patel, see particularly col. 6, last paragraph and col. 4, line 47. Kohli et al teach using gamma-glycidioxypropyltrimethoxysilane, gamma-mercaptopropyltrimethoxysilane and gamma-aminopropyltrimethoxysilane with SU - 8 resins as part of primer solutions to improve adhesion. These are thermosetting epoxy resin compositions. In Kohli et al, see particularly the abstract, paragraph bridging pages 14-15, page 16, second paragraph, col. 12, lines 40-col. 13, lines 10, and pages 25-26. Konarski et al teach the use of adhesion promoters inclusive of glycidioxy-

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propyl trimethoxy silane, and aminopropyl-triethoxy silane with heat cured multi-epoxide group epoxy resins. In Konarski et al, see particularly paragraphs [0069], [0062], Daniel et al teach using 3 aminopropyl-triethoxy silane and 3 glycidoxy-propyl trimethoxy silane as adhesion promoters in separate layers to be used with SU 8 resists (see page 46 in Daniel et al). Brewer et al teaches the need for adhesion promoters with silicon, silicon dioxide and silicon nitride substrates. They teach the use of aminoalkoxysilanes and glycidoxypropyltrimethoxysilanes and 3 mercaptopropylsilanes in separate priming layers for this purpose to be used generally with photoresist compositions that do not adhere well. With respect to instant claims 1-21, the use of those adhesion promoters known in the art to be compatible with SU-8 resins in the compositions of Hurditch et, Mrovs et al, and Mancini as taught by Kohli et al and Patel to improve adhesion to silicon substrates such as silicon wafers as taught by Brewer et al and Daniel et al wherein such adhesion promoters are inclusive of gamma-glycidoxypropyltrimethoxysilane, gamma-mercaptopropyltrimethoxysilane and gamma-aminopropyltrimethoxysilane would have been prima facie obvious as the use of materials for adhesion promoters that are known in the related arts to work with the SU-8 resists and to be advantageous with adherence problems to microelectronic supports. Gelorme et al teach the in col. 4 lines 25-40, teach using as an effective plasticizer a reactive diluent such as cycloaliphatic epoxides but also states "although other suitable reactive diluent will readily come to mind to those of ordinary skill in the art" for SU-8 photoresists. Kline et al teach the use of diglycidyl ether of hexahydrophthalic acid and an equivalent reactive diluent for epoxy silicone resins and lists it among many of those set forth by Gelorme et al. In Kline et al, see particularly col. 6, lines 1-12. With respect to instant claims 1-21, the use of the diglycidyl ether of

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hexahydrophthalic acid in exchange for the diluents set forth by Gelorme et al would as a plasticizer would have been prima facie obvious in view of Kline et al teaching the equivalency of it with those listed by Gelorme et al and because it is to be used with an epoxy resin as a reactive diluent in the photocure arts. Daniel teach on page 46 that Su-8 materials have poor adhesion and are brittle, thus the use of known plasticizers and adhesion promoters uses with such material as given above would have been prima facie obvious to reduce both of these problems in the amounts sufficient to help but not hinder the photoresist composition to work. As to the use of gamma butyrolactone as solvent for the SU-resists thus meeting the needs of the heat requirements, this is a well known solvent for the SU-8 material for this reason as already addressed by the applicants in their cited prior art to Shaw et al.

14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Roos (3,758,306) is cited to show that silane adhesive compounds are known to be added to acrylate resists such as those of Skarvinko to help with adhesion to substrates below.

*Any inquiry concerning this communication or earlier communications from the examiner should be directed to Primary Examiner Cynthia Hamilton whose telephone number is (703) 308-3626. The examiner can normally be reached on Monday-Friday, 9:30 am to 5:00 pm.*

*If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Janet Baxter can be reached on (703) 308-2303. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.*

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*Any inquiry of papers not received regarding this communication or earlier communications, or of a general nature or relating to the status of this application or proceeding should be directed should be directed to the Customer Service Center of Technology Center 1700 whose telephone number is (703) 306-5665.*

Cynthia Hamilton  
March 10, 2003



**CYNTHIA HAMILTON  
PRIMARY EXAMINER**